

### REMARKS

Applicants acknowledge receipt of an Office Action dated September 9, 2008. In this response, Applicants have amended claim 6. Support for the foregoing amendments may be found, *inter alia*, in Examples 1-3 and 4-6, the discussion at page 21, line 10-page 22, line 11, in Table 2, and in figures 5 and 6.

Following entry of this amendment, claim 6 remains pending in the application.

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

#### Information Disclosure Statement

Applicants respectfully note that the PTO has not considered reference A3 listed on the Information Disclosure Statement form SB/08 submitted by Applicants on November 12, 2004. In the Office Action of June 20, 2007, the PTO crossed off reference A3 and included an annotation noting that no English abstract was provided and that the PTO could not locate an abstract on PAJ (Patent Abstracts of Japan).

Applicants respectfully note that reference A3 was cited by the Japanese Patent Office on the International Search Report dated August 26, 2003 (a copy of the International Search Report dated August 26, 2003 was submitted with the Information Disclosure Statement on November 12, 2004). With this response, Applicants are resubmitting a copy of the International Search Report dated August 26, 2003 along with a clean copy of the form SB/08 for the PTO to initial, sign, and date and return to Applicants with its next communication.

#### Rejection Under 35 U.S.C. § 103

On page 2 of the Office Action, the PTO has rejected claims 6 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent 3015558 Grant et al. (hereafter "Grant") as allegedly evidenced by "Material Hardness", in view of U.S. Patent 6,503,345 to Klarstrom (hereafter "Klarstrom"). Applicants traverse this rejection for the reasons set forth below.

The Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.* has not removed the requirement that the prior art reference (or references when combined) must teach or suggest all the claim

limitations. Also, MPEP §2143 suggests that prior art must disclose all the features of the claimed invention as all the various rationales suggest that each element of a claim has to be known in the art before it is combined with the primary reference.

Here, Grant, Material Hardness, and Klarstrom, whether taken individually or in combination, fail to teach or suggest a “wherein a moving distance of the cutter required for completely cutting a hemp rope is doubled or less compared with an initial state of the cutter even after 1,000 cut operations are performed when a rope cut test is performed under conditions that a linear blade part of the cutter is pressed on a hemp rope having a diameter of 10 mm and the cutter is reciprocated in the horizontal direction while a load of 2 kg is applied to the cutter whereby the moving distance of the cutter required for completely cutting the hemp rope is repeatedly measured” as recited in claim 6. For at least this reason, Applicants submit that the outstanding rejection does not properly apply to amended claim 6 and ought to be withdrawn.

Furthermore, Applicants note that amended independent claim 6 comprises base Ni, Cr, and Al as well as other elements such as Mg, Ca, B, and rare earth element in the amounts recited in claim 6. The recited amounts of Mg, Ca, B, and rare earth element added to the Ni-Cr-Al type alloy for the cutting tool provide a cutting tool excellent in hot workability. These elements provide deoxidization and desulfurization effects and can be used as additives to improve the hot workability. In this regard, Applicants wish to direct the PTO’s attention to the second paragraph on page 13 of the originally filed specification.

The excellent hot workability can greatly reduce crack-formation in the crystal structure, so that it becomes possible to effectively reduce blade-breakage when the alloy is worked into the cutter or when the cutter is actually used as a cutting blade. As a result, excellent cutting properties can be maintained for a long time period as evidenced by the cut test discussed in the present specification.

The Mg, Ca, B, and rare earth elements can promote a uniform aging precipitation reaction, so that aging temperature of the is lowered. As a result, the cutter made from the alloy exhibits excellent hardness and high toughness.

Also, when these elements are added to the alloy, a sensibility of the alloy with respect to a hot-working temperature can be effectively lowered. Namely, the amounts of P, O, and S segregated in the grain boundary can be reduced by the deoxidization and desulfurization

effects of the added elements, so that it becomes possible to suppress crack-formation in the Ni-Cr-Al type alloy at the time of hot working process. As a result, it becomes possible to perform a stable hot-working operation even if a degree of accuracy of controlling the hot-working temperature is low.

Further, since the claimed amounts of P, O, and S are reduced by the above process, defects and damage caused by intervening substances originated from P, O, and S can be greatly reduced at the time the work is polished. In this regard, Applicants wish to direct the PTO's attention to the second paragraph on page 12 of the originally filed specification. When the elements selected from G, P, O, S, Cu, Si, and Mn are added to the base alloy at predetermined contents, they can effectively decrease cracks generated during working. The addition of a trace amount of Si improves corrosion resistance and the hardness of the alloy. Mn improves the hot workability.

Turning to Grant, Applicants note that Grant fails to recognize that excellent hot workability can greatly reduce crack-formation in the crystal structure, so that it becomes possible to effectively reduce blade-breakage when the alloy is worked into the cutter or when the cutter is actually used as a cutting blade. Grant also fails to recognize that, as a result, an excellent cutting properties can be maintained for a long time period as evidenced by the cut test.

Further, Applicants note that Grant describes a relation between heat treatment and hardness of the resultant alloy. However, Grant fails to describe suitable contents of impurities for the cutter. Namely, Grant merely discloses an alloy having a composition of 28-45% Cr, 1-6% Al, and the balance of Ni.

In addition, the remaining references neither disclose nor suggest the preferable composition of the Ni-Gr-Al type alloy for the purpose of improving the hot-workability of the Ni-Cr-Al type alloy used in the presently claimed invention and neither disclose nor suggest a concept of optimizing the amount of P, O, and S for the purpose of solving the problem caused at the time of polishing work.

Applicants note that the PTO suggested that Karlstrom teaches nickel-base alloy composition and describes that P, O, and S are undesirable alloying elements that are usually present in alloys up to 0.1 %, and, on this basis, has suggested that it would have been

obvious that the alloy of Grant would have P, O, and S in the claimed composition, since Karlstrom teaches that these elements are usual impurities in nickel alloys.

Karlstrom, however, at col. 8, lines 37-39 states that "such element may be present in amounts up to about 0.1% without substantial harm to alloys." Karlstro provides no description of what the substantial harm could be, and, in addition, does do not disclose a concrete usage of the resultant alloy. Karlstrom fails to discuss any influence of P, O, and S contained in a cutting tool.

When the usage as a cutting tool is taken into consideration, the amount of P, O, and S must be severely restricted the 0.003% or less level as specified in claim 6. This low level of of P, O, and S specified in the presently claimed invention is not a usual level as mentioned in Karlstrom.

Even if the alloy of Grant were combined with the alloy containing the amount of P, O, and S discussed in Karlstrom, this would not result in the presently claimed cutting tool. The presently claimed invention, in contrast to the cited references, is directed to an alloy for a cutter comprising a composition of 32-44% Cr, 2.3-6% Al, and a balance of Ni. When the amount of Cr is less than 32% or larger than 44%, the blade durability is lowered and a sufficient cutting property cannot be obtained. Further, when the amount of Al is less than 2.2% or larger than 6%, the blade durability deteriorates, and the alloy is not suitable for usas as cutter material.

In addition, the presently claimed cutter comprises at least one element selected from the group consisting of Mg, Ga, B and rare earth element in the specified amount. The cutter has excellent hot workability. This excellent hot workability can greatly reduce crack-formation in the crystal structure, so that it becomes possible to effectively reduce blade-breakage when the alloy is worked into the cutter or when the cutter is actually used as a cutting blade. As a result, an excellent cutting property can be maintained for a long time period as evidenced by the cut test as specified in the amended claim 1.

In this connection, the PTO suggested that "[i]f the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present". However, in general, the hardness of the alloy is determined by not only composition of the alloy but also heat treatment for the alloy. Actually, the physical properties of the alloy are greatly varied depending on the heat treatment conditions. Thus, Applicants submit that the

PTO's rationale with respect to this point is flawed and that a person skilled in this art would recognize that alloys having similar compositions could have very different structures.

In the cutting tools, not only high hardness of the alloy but also the reduction of crack-formation in the alloy structure effectively contribute to improve the blade durability. These points are neither recognized nor discussed in any of the documents cited in the outstanding rejection.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the outstanding rejection under § 103.

### **CONCLUSION**

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 2/9/09

By P.D.S.

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